SECTION 5

EVANSVILLE, IN

The estimates of vulnerability and availability presented in this report represent statistical averages and overall assessments resulting from the application of a new, preliminary methodology. They are intended for emergency management and planning purposes only.

5.1 Location and Characteristics

The City of Evansville is located in extreme southwest Indiana, on the north bank of the Ohio River. This city is the third most populous of the six cities, with a 1980 population of approximately 130,000 persons, and is a major regional center for commerce, medical services, industry and education.

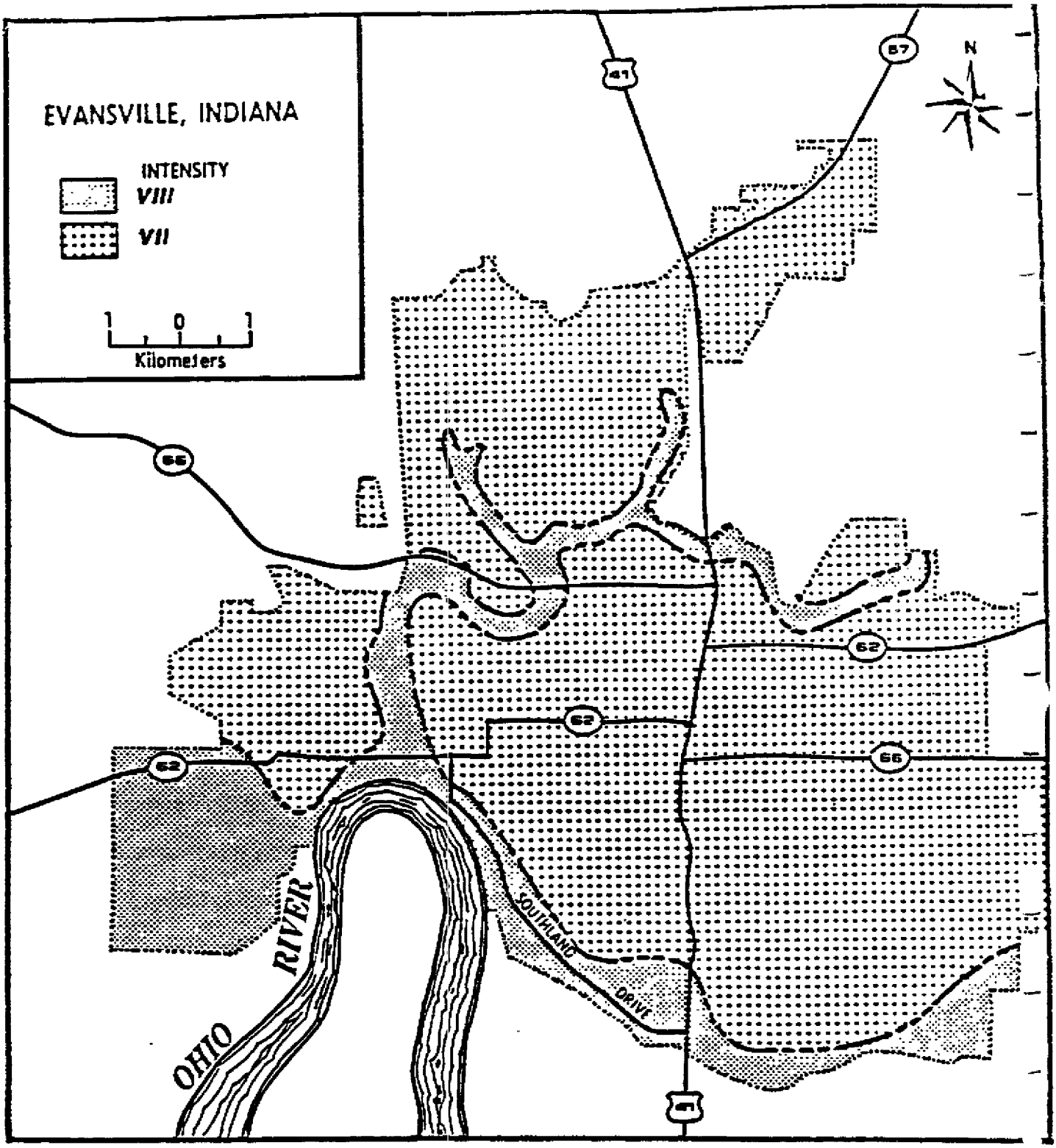
Physiographic Description (from Reference 16):

Evansville is situated along the Ohio River in the Interior Low Plateaus province (Fenneman, 1938). Topographic relief within the city proper is low; some of the banks along the Ohio River are steep.

Figures 5-1 and 5-2 show the hypothetical ground shaking intensities estimated in Evansville following the occurrence of either scenario earthquake. These levels of ground motion will cause significant damage and disruption in Evansville, as reflected in the findings presented in this section.

5.2 Medical Resources and Facilities

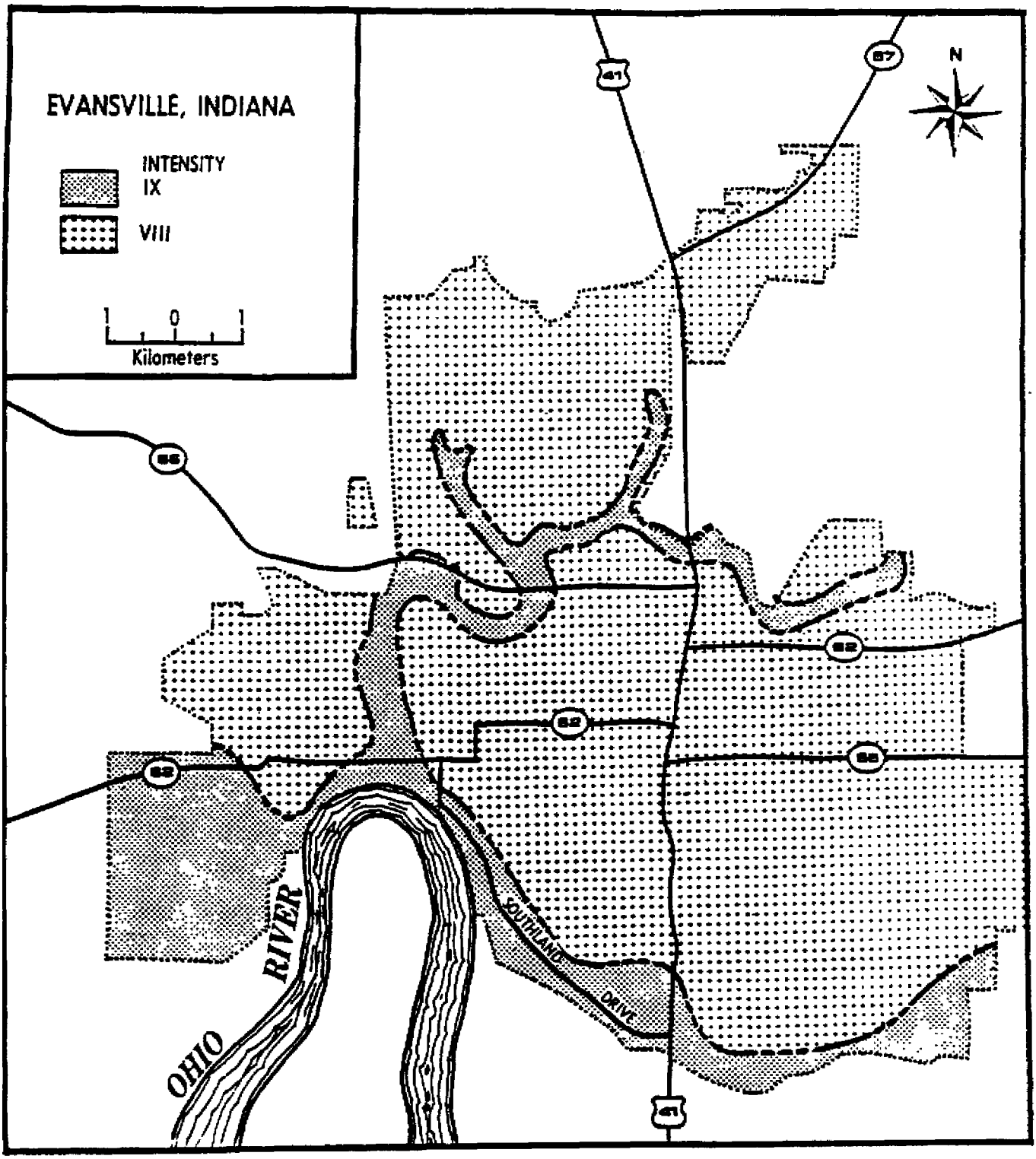
Evansville possesses a full spectrum of medical services and facilities. They provide medical support to the city, surrounding communities and general region. Medical services surveyed during



Hypothetical intensity map for Evansville, for a magnitude M(S)=7.6 earthquake. For an earthquake near the north end of the New Madrid seismic zone, intensities projected for Evansville at VIII along the Ohio River flood plain and its tributary and VII for the lacustrine sediments of the restof the city. For earthquake near the south end of the New Madrid seismic zone, intensities at Evansville would be lower.

Reference 16

FIGURE 5-1



Hypothetical intensity map for Evansville, Indiana. For an Ms=8.6 earthquake near the north end of the New Madrid seismic zone, intensities projected for Evansville are: IX along the Ohio River flood plain and its tributary and VIII for the lacustrine sediments of the rest of the city. For an earthquake near the south end of the New Madrid seismic zone, the intensity at Evansville would be lower.

Reference 16

FIGURE 5-2

this project were: Major Hospitals, Blood Banks, Clinical Laboratories, Ambulance Services and Personnel.

5.2.1 Major Hospitals

The City of Evansville is served by four major hospitals. The 20 major structures comprising these facilities were analyzed for their availability following the postulated earthquakes. Evansville hospitals will sustain relatively little severe damage with 90% of buildings and hospital beds estimated to be available. All facilities are equipped with emergency electrical power units, which are likely to be available. Table 5-1 shows the findings of the availability analysis for major hospital service in Evansville.

TABLE 5-1
AVAILABILITY OF MAJOR HOSPITAL FACILITIES
EVANSVILLE, IN

Base Information

Major Hospitals Surveyed	Hospital Structures Surveyed	Beds In Surveyed Structures
4	20	2,242

AVAILABILITY ANALYSIS

Earthquake	Hospital Structures Estimated To Be Available/Percent	Beds Estimated To Be Available Percent	Emergency Power Unit Available
Ms=7.6	18/90%	2,020/90%	Yes
Ms=8.6	15/75%	1,620/72%	Yes

5.2.2 Blood Banks

Probable availability of blood storage facilities in Evansville following the Ms=7.6 and the Ms=8.6 earthquakes is shown in the following table. The structures are normally provided with emergency power units, which are estimated to be available for service.

BLOOD STORAGE FACILITIES
(Blood Banks)
EVANSVILLE, IN

	Number of Facilities Surveyed	Number Estimated to Be Available	
		Ms=7.6	Ms=8.6
Major Hospital:	4	4/100%	3/75%
Non-Hospital:	3	2/67%	1/33%
Total	7	6/86%	4/57%

5.2.3 Clinical Laboratories

The availablity of clinical laboratory facilities in Evansville following an occurrence of the Ms=7.6 and Ms=8.6 earthquakes, is depicted in the following table. Those facilities associated with major hospitals can utilize the hospitals' emergency power system. The availability of emergency power to non-hospital laboratories was not inventoried or analysed.

AVAILABILITY OF CLINICAL LABORATORIES
EVANSVILLE, IN

	Total Number Surveyed	Number Estimated To Be Available/Percent	
		Ms=7.6	Ms=8.6
Major Hospitals	4	4/100%	3/75%
Other	2	1/50%	1/50
Totals	6	5/83%	4/67%

5.2.4 Ambulance Services

The availability of ambulance service structures in Evansville following an occurrence of the Ms=7.6 and the Ms=8.6 scenario earthquakes is depicted in the following table. As ambulances are frequently parked outdoors, the survival of vehicles is likely to be good, but difficult to quantify. Structures contain supplies,

communications equipment and personnel, and thus contribute significantly to the provision of this service.

AVAILABILITY OF AMBULANCE SERVICE STRUCTURES
EVANSVILLE, IN

Number of Structures Surveyed	Number Estimated To Be Available/Percent	
	Ms=7.6	Ms=8.6
3	3/100%	2/67%

5.2.5 Personnel

Casualties among medical personnel are presented collectively in Tables 3-2 and 3-3, Section 3.

5.3 Public Services

This part presents the probable availability of selected vital services, facilities and systems in Evansville, following the occurrence of the Ms=7.6 and the Ms=8.6 scenario earthquakes. These services include fire fighting and police, communications, transportation and utility systems.

5.3.1 Fire Services

The following table shows the estimated availability of fire fighting structures. Since fire fighting vehicles and other equipment are typically located inside a structure, the loss of a structure contributes to the non-availability of needed equipment.

AVAILABILITY OF FIRE SERVICE STRUCTURES
EVANSVILLE, IN

Total Structures Surveyed	Structures Estimated To Be Available	
	Ms=7.6	Ms=8.6
13	11/85%	9/70%

5.3.2 Police Services

The following table shows the estimated availability of police service structures in Evansville.

AVAILABILITY OF POLICE SERVICES STRUCTURES
EVANSVILLE, IN

Total Structures Surveyed	Structures Estimated To Be Available	
	Ms=7.6	Ms=8.6
1	1/100%	1/100%

5.4 Communications

The following table shows the estimated availability of radio, television, and telephone structures in Evansville following the occurrence of the Ms=7.6 and the Ms=8.6 scenario earthquakes.

AVAILABILITY OF COMMUNICATIONS STRUCTURES
EVANSVILLE, IN

	Total Structures Surveyed	Structures Estimated To Be Available	
		Ms=7.6	Ms=8.6
Radio	5	4/80%	2/40%
Television	-	-	-
Telephone	5	4/80%	3/60%
Total	10	8/80%	5/50%

5.5 Transportation Systems

5.5.1 Highways

The probable effects of the two earthquakes on major highways in Evansville and Vanderburgh County are summarized in the following distribution of section survival probabilities:

Probability of Survival	Number of Sections (City Only)		Number of Sections (City + County)	
	Ms = 7.6	Ms = 8.6	Ms = 7.6	Ms = 8.6
0.00 - 0.25	-	1	-	1
0.26 - 0.50	-	1	-	4
0.51 - 0.75	1	-	1	2
0.76 - 1.00	14	13	26	20
Total	15	15	27	27

The probabilities of survival calculated for the individual sections are shown in Table 5-2. Figures 5-3 and 5-4 indicate graphically the sections most likely to remain passable after the stronger of the two earthquakes.

Within the city limits, the two most vulnerable highway sections would be County Route 56 (Barker Avenue/Broadway) and State Route 62 in the southwestern corner of the city. All the other major highways inside the city would be very likely to remain in service after the Ms = 7.6 earthquake, and all but one or two would still be passable after the Ms = 8.6 event.

Outside the city limits, the highways most likely to provide uninterrupted access would be State Routes 57 from the north and 62 and 66 from the east. After the Ms = 7.6 scenario event, *all major* highway sections providing access to the city would survive with a probability of 0.90 or greater. After the Ms = 8.6 scenario earthquake, however, access would be restricted on some of the routes entering from the west and south, although it is quite unlikely that all would be cut.

5.5.2 Railways

The probable effects of the two earthquakes on major railway lines in Evansville and Vanderburgh County are summarized in the

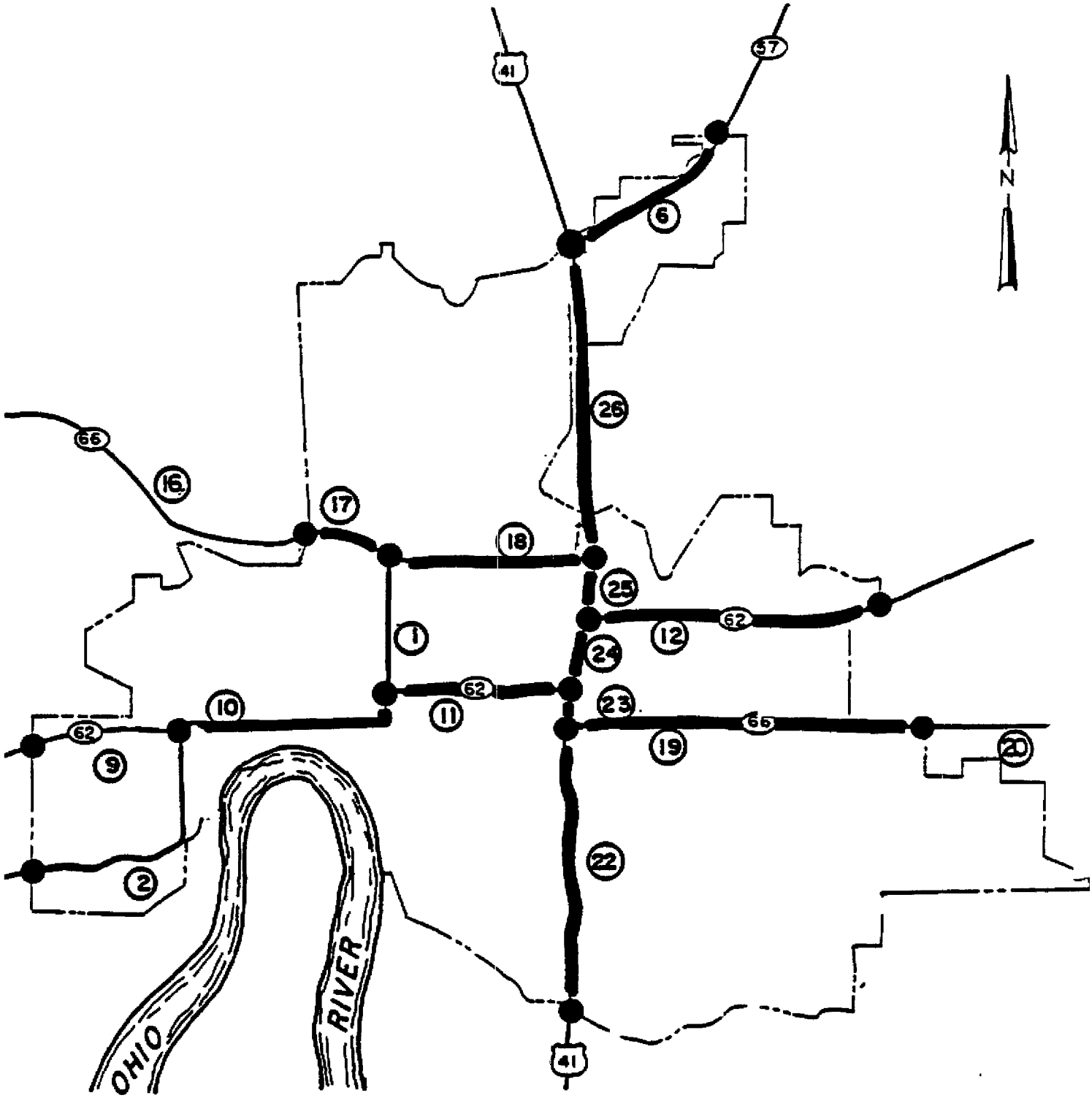
TABLE 5-2

PROBABILITY THAT ALL BRIDGES ON AND OVER HIGHWAY SECTIONS WOULD SURVIVE NEW MADRID EARTHQUAKE

EVANSVILLE/VANDERBURGH COUNTY

Highway Section No.	Route No.	No. of Support Structures		No. of Over-passing Struct.	Earthquake Intensity (MMI)		Probability of Survival	
		Single Struct.	Parall. Pairs		Ms=7.6	Ms=8.6	Ms=7.6	Ms=8.6
1	C033	1			VIII	IX	.97	.78
2	C056	3			VIII	IX	.68	.20
3*	C056	2			VIII	IX	.90	.48
4*	I64		3	3	VII	VIII	1.00	1.00
5*	I64		2	2	VII	VIII	1.00	.99
6	SR57				VII	VIII	1.00	1.00
7*	SR57	3		2	VII	VIII	.97	.86
8*	SR62				VIII	IX	1.00	1.00
9	SR62	3			VIII	IX	.86	.33
10	SR62	1		2	VII/VIII	VIII/IX	.97	.79
11	SR62				VII	VIII	1.00	1.00
12	SR62				VII	VIII	1.00	1.00
13*	SR62				VII	VIII	1.00	1.00
14*	SR65	2			VII	VIII	.97	.73
15*	SR66		1		VII	VIII	1.00	1.00
16*	SR66	4			VII/VIII	VIII/IX	.92	.47
17	SR66				VIII	IX	1.00	1.00
18	SR66	1		2	VIII/VII	IX/VIII	.97	.76
19	SR66			2	VII	VIII	1.00	.98
20*	SR66				VII	VIII	1.00	1.00
21*	US41		3		VIII	IX	.98	.70
22	US41				VII	VIII	1.00	1.00
23	US41		1		VII	VIII	1.00	1.00
24	US41				VII	VIII	1.00	1.00
25	US41				VII	VIII	1.00	1.00
26	US41	1	1		VII/VIII	VIII/IX	1.00	.93
27*	US41	4	2	2	VII	VIII	.92	.39

* Located in Vanderburgh County outside the city limits of Evansville.

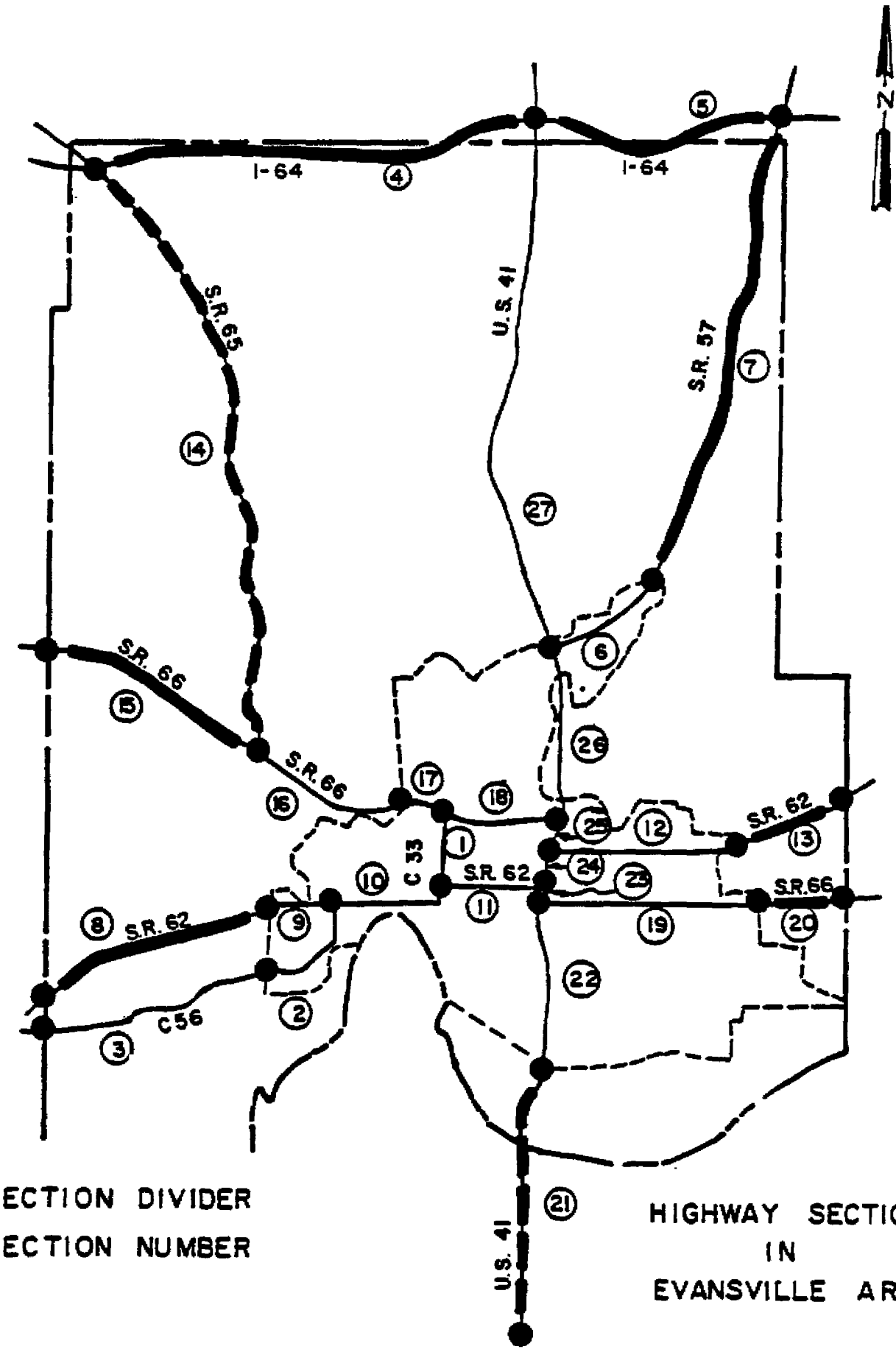


● SECTION DIVIDER

○ SECTION NUMBER

HIGHWAY SECTIONS
IN
EVANSVILLE CITY LIMITS

FIGURE 5-3



● SECTION DIVIDER

○ SECTION NUMBER

HIGHWAY SECTIONS IN EVANSVILLE AREA

FIGURE 5-4

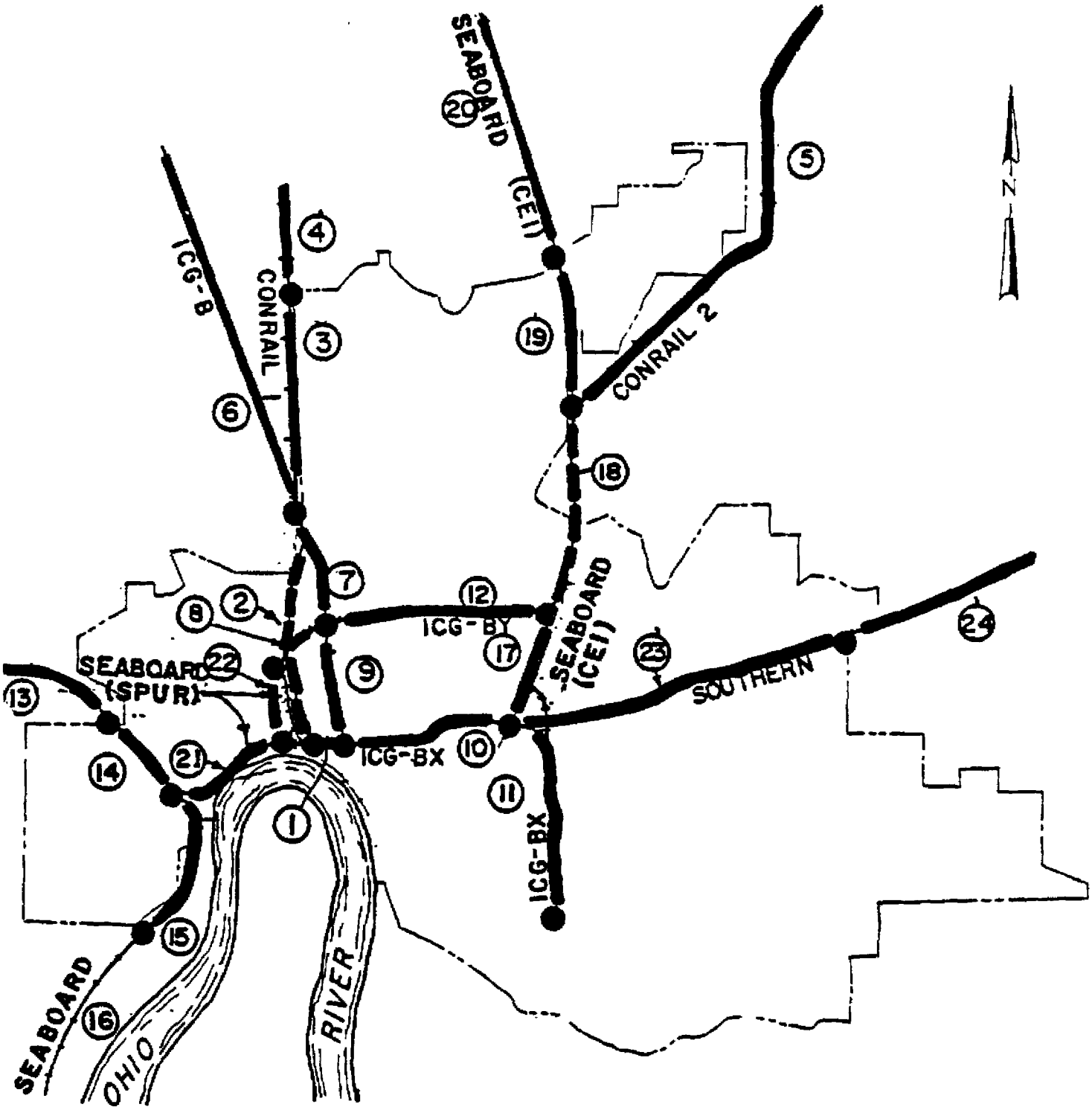
following distribution of section survival probabilities:

Probability of Survival	Number of Sections (City Only)		Number of Sections (City + County)	
	Ms = 7.6	Ms = 8.6	Ms = 7.6	Ms = 8.6
0.00 - 0.25	-	-	-	-
0.26 - 0.50	-	-	-	1
0.51 - 0.75	-	4	-	4
0.76 - 1.00	17	13	24	19
Total	17	17	24	24

The probabilities of survival calculated for the individual sections are shown in Table 5-3. Figures 5-5 and 5-6 indicate graphically the sections most likely to remain passable after the stronger of the two earthquakes.

Within the city limits, no section would be especially vulnerable to an Ms = 7.6 event; all sections would survive with a probability of 0.94 or greater. If an Ms = 8.6 scenario event occurred, the most vulnerable lines would be Conrail and ICG lines that cross and run alongside Pigeon Creek near its junction with the Ohio River and the Seaboard Systems line that crosses Pigeon Creek farther upstream.

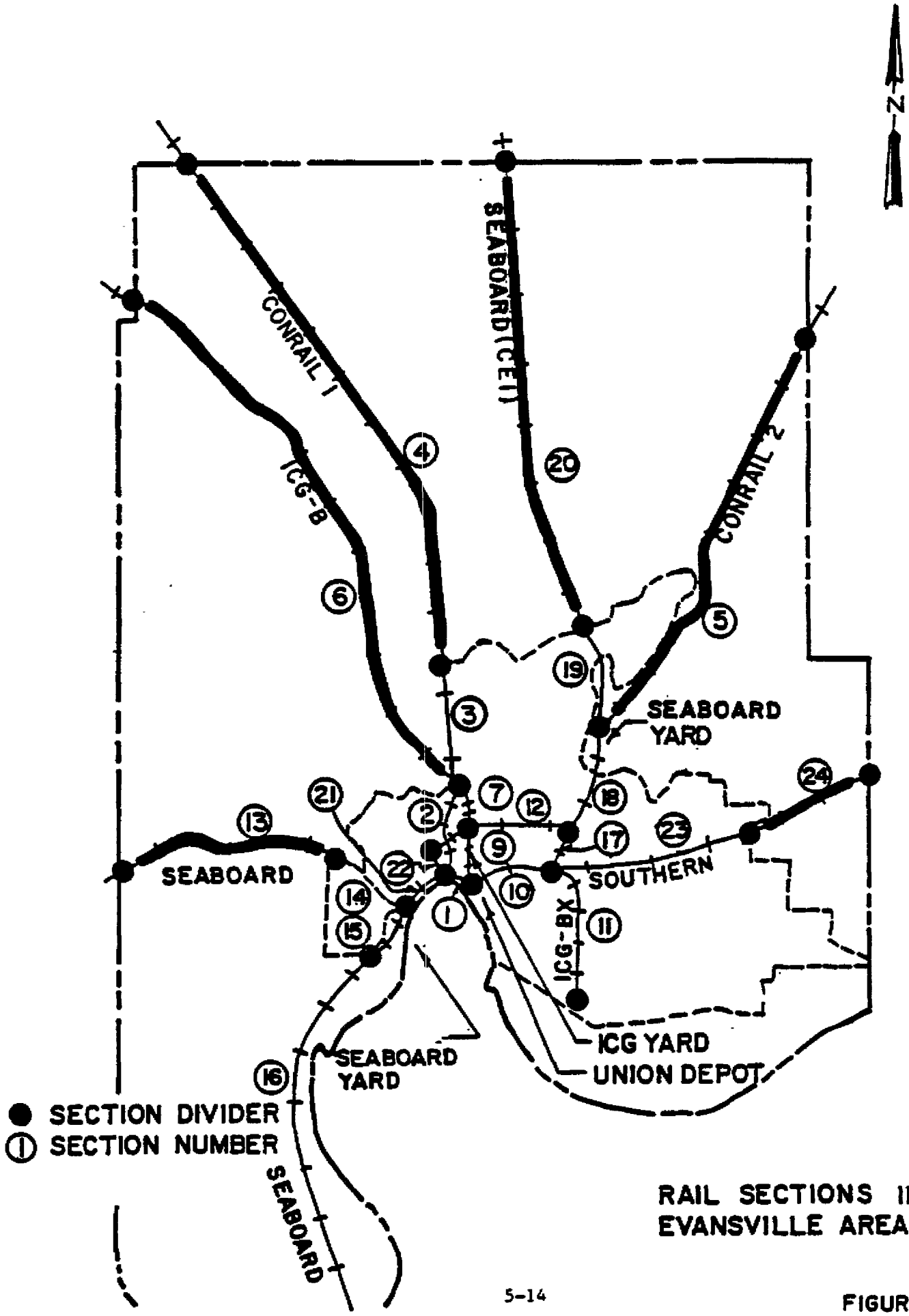
Access to the city from the outside would remain good, even after the Ms = 8.6 event. Of the six lines entering the city from the east, west and north, at least four and probably five would remain passable. The line most likely to be interrupted would be the Seaboard Systems line entering the city from the south. It is unlikely that any of the lines providing access to the city would be impassable after an Ms=7.6 event.



● SECTION DIVIDER
(1) SECTION NUMBER

RAIL SECTIONS IN
EVANSVILLE CITY LIMITS

FIGURE 5-5



RAIL SECTIONS IN EVANSVILLE AREA

FIGURE 5-

TABLE 5-3

PROBABILITY THAT ALL BRIDGES ON AND OVER RAILWAY SECTIONS WOULD SURVIVE NEW MADRID EARTHQUAKE

EVANSVILLE/VANDERBURGH COUNTY

Railway Section No.	Line No.	No. of Support Structures: Single Struct.	No. of Support Structures: Parall. Pairs	No. of Over-passing Struct.	Earthquake Intensity (MMI): Ms=7.6	Earthquake Intensity (MMI): Ms=8.6	Probability of Survival: Ms=7.6	Probability of Survival: Ms=8.6
1	CONTRAIL1	1			VIII	IX	.95	.69
2	CONTRAIL1	1		4	VIII/VII	IX/VIII	.91	.54
3	CONTRAIL1	1			VII	VIII	.99	.95
4*	CONTRAIL1	1		4	VII	VIII	.99	.91
5*	CONTRAIL2	2			VII	VIII	.98	.90
6*	ICG-B	9		1	VII	VIII	1.00	.76
7	ICG-B	1		1	VIII	IX	.97	.76
8	ICG-B	1			VIII	IX	.95	.69
9	ICG-BX				VII	VIII	1.00	1.00
10	ICG-BX				VII	VIII	1.00	1.00
11	ICG-BX				VII	VIII	1.00	1.00
12	ICG-BX				VII	VIII	1.00	1.00
13*	SEABOARD	1			VII	VIII	.99	.95
14	SEABOARD			1	VIII	IX	.98	.89
15	SEABOARD			1	VIII	IX	.98	.89
16*	SEABOARD	2			VIII	IX	.90	.48
17	SEABOARD-CEI	1			VII	VIII	1.00	.97
18	SEABOARD-CEI	2			VII/VIII	VIII/IX	.94	.66
19	SEABOARD-CEI	1			VII	VIII	.99	.95
20*	SEABOARD-CEI	2		2	VII	VIII	.98	.88
21	SEABOARD-SPUR				VII	VIII	1.00	1.00
22	SEABOARD-SPUR			2	VIII	IX	.98	.87
23	SOUTHERN	1			VII	VIII	1.00	.98
24*	SOUTHERN				VII	VIII	1.00	1.00

* Located in Vanderburgh County outside the city limits of Evansville.

5.5.3 River Ports

Due to the generally unfavorable soil conditions which are typical for the river bank location of port and dock facilities, it is estimated that these facilities will not be available for use in

Evansville following an occurrence of either of the earthquake scenarios.

5.5.4 Airports

As discussed in the general section on airports (Section 3.5.4) airport runways will generally be at least partially available for use in Evansville following the scenario earthquakes. Delicate and complex landing-aid instruments and devices, as well as general lighting, are not estimated to be available. Airport buildings have a probability of damage typical for others in the area of similar structural type.

5.6 Public Utilities

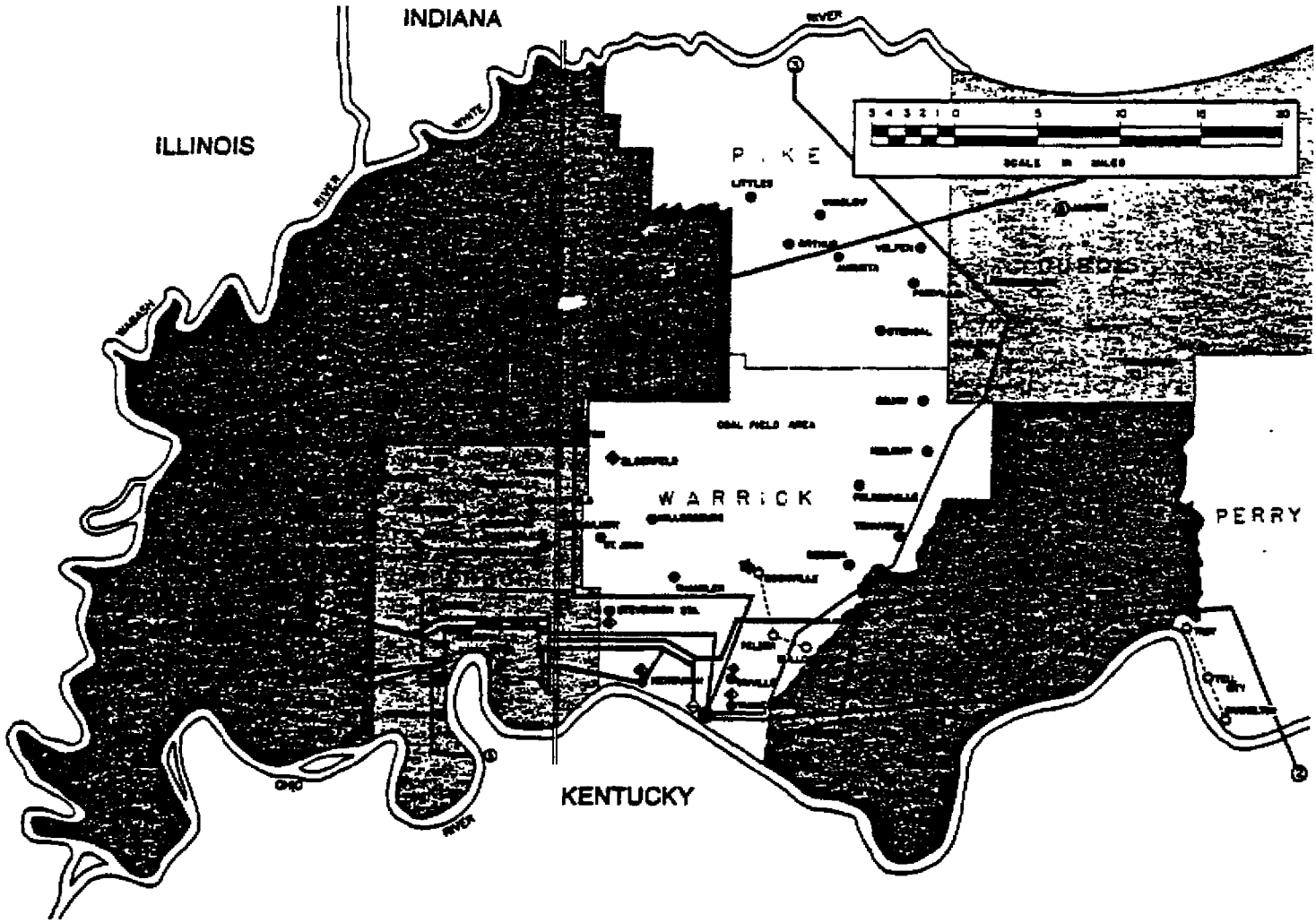
5.6.1 Electric Utilities

The Southern Indiana Gas and Electric Company (SIGECO) serves Evansville, population 130,000. SIGECO has approximately 800 full time employees, 118 radio equipped vehicles, four branch offices with the main office in Evansville. SIGECO has five generating stations, none of which are located in Evansville, one standby reserve, fourteen bulk power stations (no spare transformer), eighty-seven distribution stations (150 MVA reserve station equipment) and four mobile substations. SIGECO has five major transmission interconnections with other electric utilities. Figure 5-7 depicts major elements of the Evansville system.

Availability Analysis

The following table presents the results of the availability analysis. Fragility techniques and system factors indicate that damage to this utility system will be significant, and that it is probable that it will not be available following an occurrence of

SIGECO'S
Business and Service Area



The Company is engaged in the generation, transmission, distribution and sale of electricity in a southwestern Indiana region of about 2,250 square miles, with a population estimated to be nearly 350,000. Electric service is supplied directly to Evansville and 74 other cities, towns and communities, and adjacent rural areas. Wholesale electric service is supplied to an additional 8 communities. The Company serves 100,880 electric customers.

The Company is also engaged in the purchase, distribution and sale of natural gas in Evansville and 22 other nearby communities and their environs. Gas service is supplied to 61,293 customers. Prior to 1978, natural gas was purchased exclusively from Texas Gas Transmission Corporation under a 17-year Service Agreement dated September 1, 1970. The gas supply for the Ft. Branch Natural Gas Company system, acquired in 1978, is purchased from Texas Eastern Transmission Corporation.

For the year ended December 31, 1979, electric revenues accounted for 75.1% and gas revenues were 24.9% of total operating revenues.

Legend

- ● Electric Service — Retail
- ○ Electric Service — Wholesale
- ◆ Gas Service — Retail
- ● Steam Electric Plant
- ⊖ Gas Turbine Electric Peaking Plant
- ① Interconnection with Public Service Indiana
- ② Interconnection with Louisville Gas and Electric Company
- ③ Interconnection with Indianapolis Power & Light Company
- ④ Interconnection with Indiana Statewide Rec. Inc.
- ⑤ Interconnection with Big Rivers Electric Corporation
- ⑥ Interconnection with The City of Jasper, Indiana (69KV)
- ◈ Interconnection with ALCOA'S Steam-Electric Generating Station
- ▬ Electric Lines of SIGECO — 138KV
- ▬ Electric Lines of wholesale Customers
- ▬ Gas Pipelines — SIGECO
- ✱ Pipeline Metering Points
- ▬ Gas Pipelines other Companies
- Oliver Gas Storage Field
- Midway Gas Storage Field
- ★ District Offices

FIGURE 5-7

either the Ms=7.6 or the Ms=8.6 earthquake.

AVAILABILITY OF ELECTRIC UTILITIES
EVANSVILLE, IN

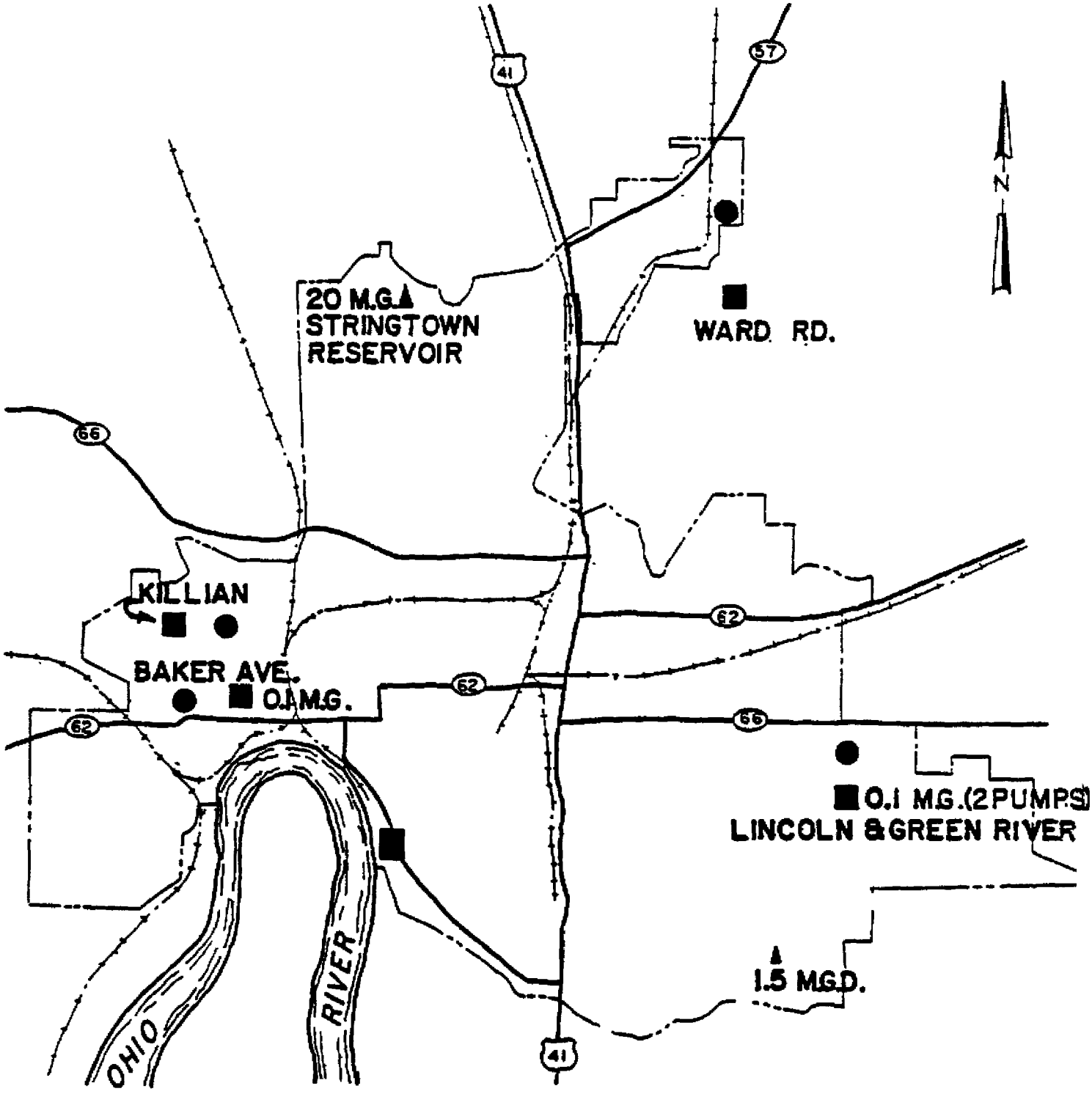
Total Number Of Structures Surveyed		Structures Estimated To Be Available/Percent		Overall System Availability(Yes/No)	
		Ms=7.6	Ms=8.6	Ms=7.6	Ms=8.6
Substations	11	7/64%	0/0%	No	No
Power Plants	1	0/0%	0/0%		
Total	12	7/58%	0/0%		

5.6.2 Water Utility

The City of Evansville's main source of water is the Ohio River. The water treatment plant has the capacity to treat 60 MGD. In addition, the city operates a 1.5 MGD deep well as an auxiliary source of water. The water treatment plant operations include sedimentation, coagulation, filtration and chlorination. A network of water mains ranging in size from 2 inches to 48 inches distribute water to the water service area. Booster pumping stations are located throughout the city, particularly in the outlying areas. Water storage consists of both elevated tanks and underground reservoirs. Underground storage includes the 6 MG reservoir at the water treatment plant and the 20 MG Stringtown Reservoir. The elevated tanks are dispersed throughout the city, typically having a capacity of 100,000 gallons. Booster pumping stations are often located near the storage tanks. Figure 5-8 shows the water treatment plant, storage facilities, and booster pumping station locations.

Availability Analysis

The following table presents the results of the availability analysis. Damage to system elements (treatment plants, tanks, pump



● STORAGE FACILITY
▲ WATER RESERVOIR

■ BOOSTER PUMPING STATION
▬ 60 MGD WATER TREATMENT PLANT
▲ AUXILIARY WELL

WATER SYSTEM
EVANSVILLE, INDIANA

FIGURE 5-8

stations and piping distribution system), coupled with the estimated loss of electric power make it likely that this sytem would not be available following an occurrence of either the Ms=7.6 or the Ms=8.6 earthquake.

AVAILABILITY ANALYSIS WATER UTILITY
EVANSVILLE, IN

Structures Surveyed	Total Number of	Structures Estimated To Be Available/Percent Ms=7.6	Ms=8.6
Treatment Plants	1	0/0%	0/0%
Storage Tanks:			
Elevated	3	1/33%	0/0%
Non-elevated	2	2/100%	1/50%
Pump Stations	4	3/75%	2/50%
Total	10	5/50%	3/33%

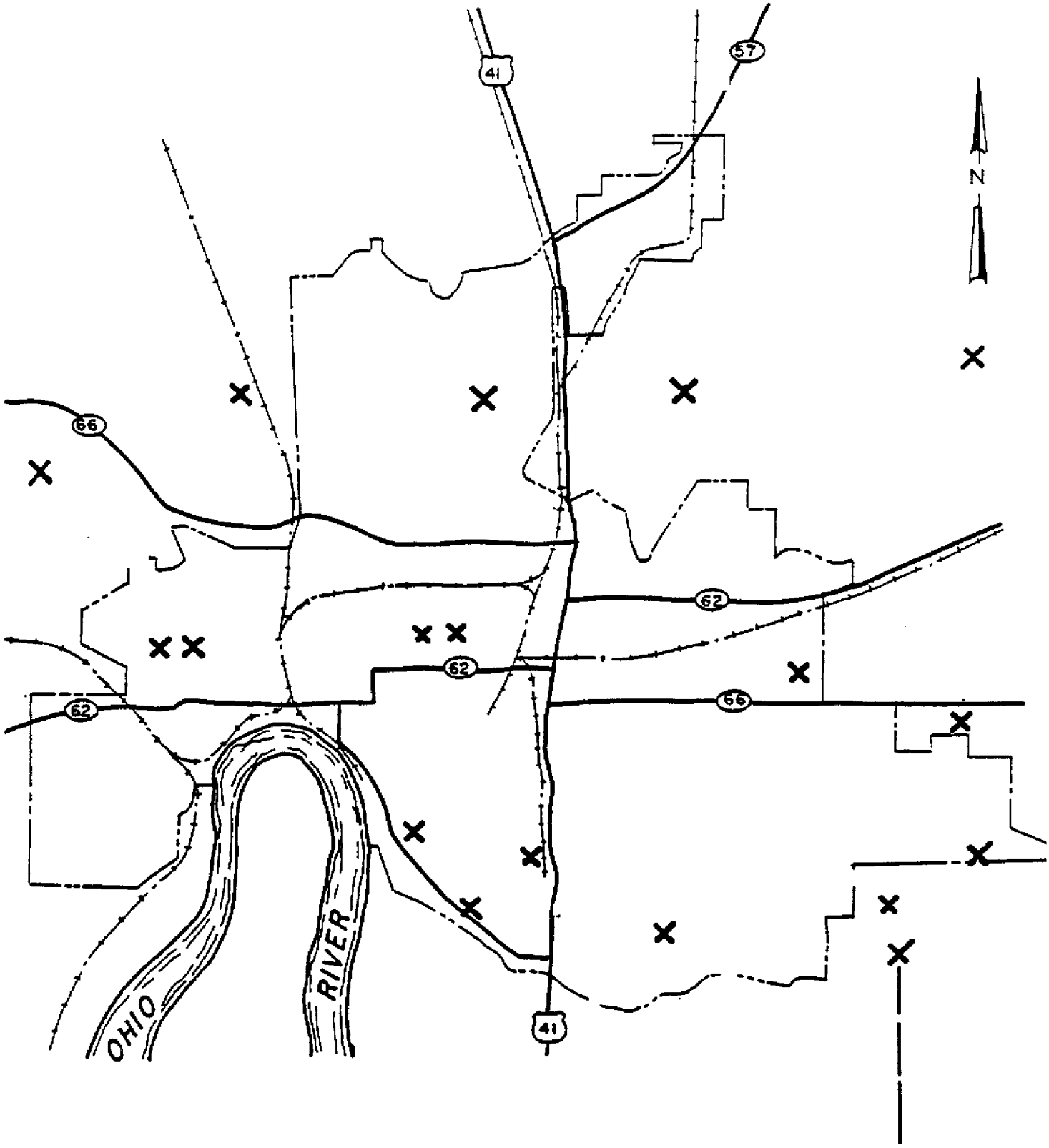
SYSTEM AVAILABILITY
(Yes/No)

Ms=7.6	Ms=8.6
No	No

5.6.3 Natural Gas Utility

The natural gas system of Evansville, Indiana is owned by Southern Indiana Gas & Electric Company. The system has two (2) purchase points and buys its gas from Texas Gas Transmission Company. There are no propane-air or LNG plants in the system. Eight-hundred-sixty-five (865) miles of steel, plastic and cast iron piping make up the system. Figure 5-9 depicts Evansville's gas utility system.

The cast-iron piping in the system would crack and rupture in many places in the event of any substantial earth movement in Evansville. Damage would be greatest for the Ms=8.6 earthquake. Additionally, some damage to service piping and meter sets would



X GATE STATION
— — TRANSMISSION LINE

NATURAL GAS FACILITIES
EVANSVILLE, INDIANA

FIGURE - 5 - 9

occur from buildings and debris hitting these items.

The natural gas system serving Evansville would have to be shut down immediately following an occurrence of either earthquake scenario. Small sections of the system could be restored in twenty-four hours to provide heat for a few selected shelter areas. The remainder of the system would have to be restored on a customer by customer basis. This process should take three to four weeks.

Availability Analysis

As discussed above, this system is estimated to be unavailable following either the Ms=7.6 or the Ms=8.6 earthquake.

5.6.4 Sewage System

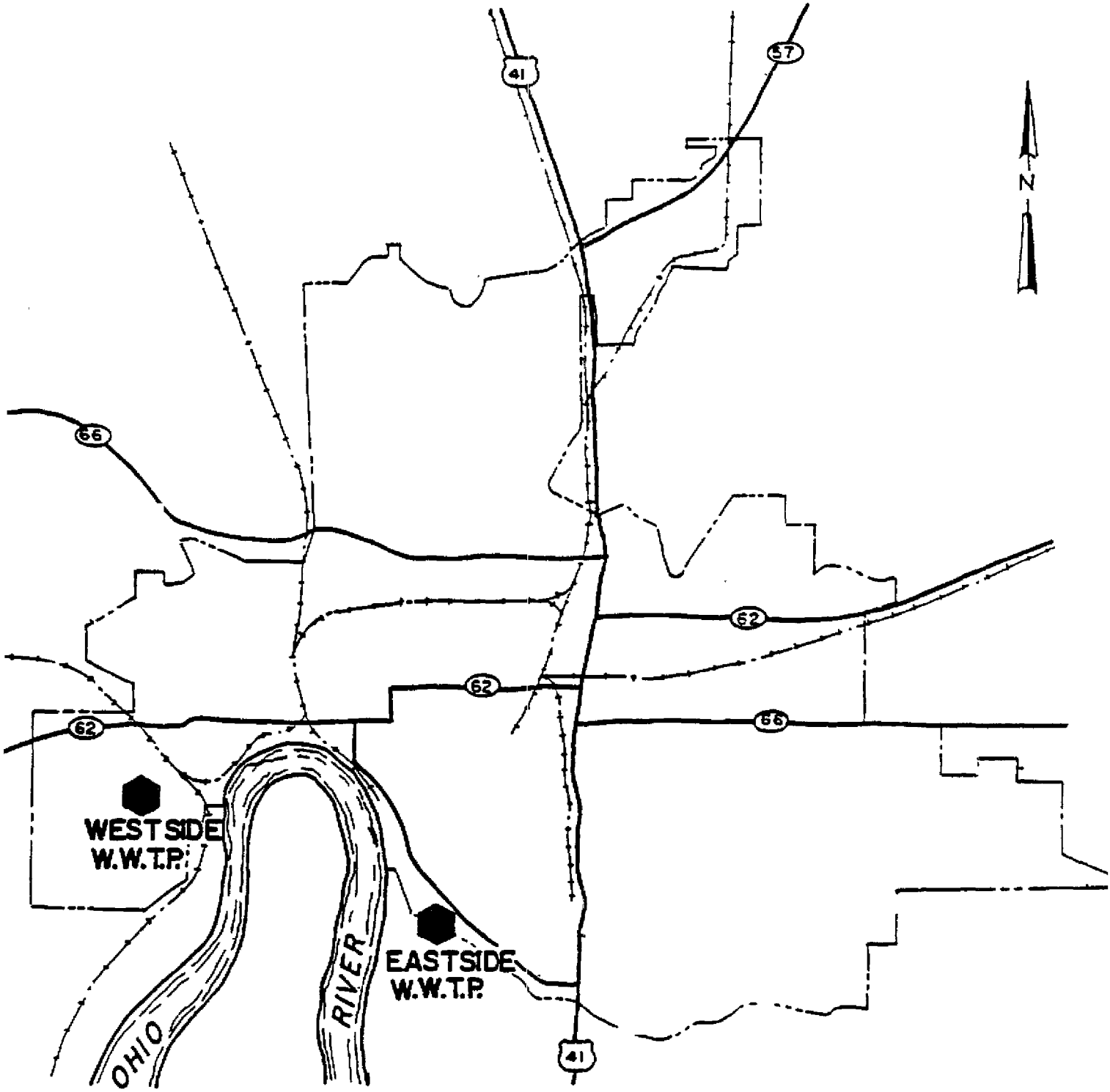
The Evansville Sewer Department provides wastewater treatment for the City of Evansville and Vanderburgh County. Both the Eastside wastewater treatment plant and the Westside wastewater treatment plant discharge treated wastewater into the Ohio River. The Eastside WWTP is an activated sludge facility with a design capacity of 18.0 MGD. The treatment plant operations include influent pumping, grit removal, clarification, aeration, chlorination, sludge digestion and vacuum filtration. The main line pumps are operated by V-8 engines which use natural gas or methane gas produced on-site. The methane is stored in a tank at the wastewater treatment plant. Standby pumping is provided by electrically operated pumps. The Westside WWTP has a design capacity of 20.6 MG and is also an activated sludge system. The unit processes are essentially the same as those at the Eastside plant. The main line pumps are operated in the same manner as the Eastside WWTP. However, the Westside WWTP has an auxiliary generator which operates the cooling water jacket pumps on the V-8

engines. The Eastside plant has had no difficulty with overheating of pumps and therefore, has no auxiliary generator. Figure 5-10 shows the location of each wastwater treatment plant.

The Sewer Department operates fifty-one (51) wastewater lift stations throughout Vanderburgh County. In addition, there are six (6) combined sewer overflow structures and two structures which allow stormwater ponding during heavy rains. The storm and sanitary wastewater collection systems are combined in Evansville and Vanderburgh County. The sewers range in size from 8-inch to 96-inch pipe. The older sewers in the center of the city are brick lined with concrete. The newer pipe is primarily concrete and plastic. The force mains are generally iron with some plastic pipe.

Availability Analysis

The following table gives the results of the availability analysis for this system. The "conditional" negative finding for availability in the case of the Ms=7.6 event is based upon loss of all fueling/powering the main pumps at the waste treatment plants. If the pumps are operational, the system could have limited use. Collection system damage and loss of lift stations may be an added significant negative factor.



● WASTEWATER TREATMENT PLANT (W.W.T.P.)

WASTEWATER TREATMENT FACILITIES
EVANSVILLE, INDIANA

FIGURE 5-10

AVAILABILITY ANALYSIS SEWAGE SYSTEMS
EVANSVILLE, IN

Number of Structures Surveyed	Structures Estimated To Be Available/Percent	
	Ms=7.6	Ms=8.6
Treatment Plants: 2	0/0% (Conditional)	0/0%

SYSTEM AVAILABILITY
(Yes/No)

Ms=7.6	Ms=8.6
No (Conditional)	No

5.7 Dams and Levees

The general circumstances involved with the failure of dams and levees was discussed in Section 3.7. Figure 5-11 depicts areas of Evansville which are subject to flooding due to levee failure caused by both the Ms=7.6 and the Ms=8.6 earthquake. Persons displaced by flooding is tabulated in Section 5.9.2.

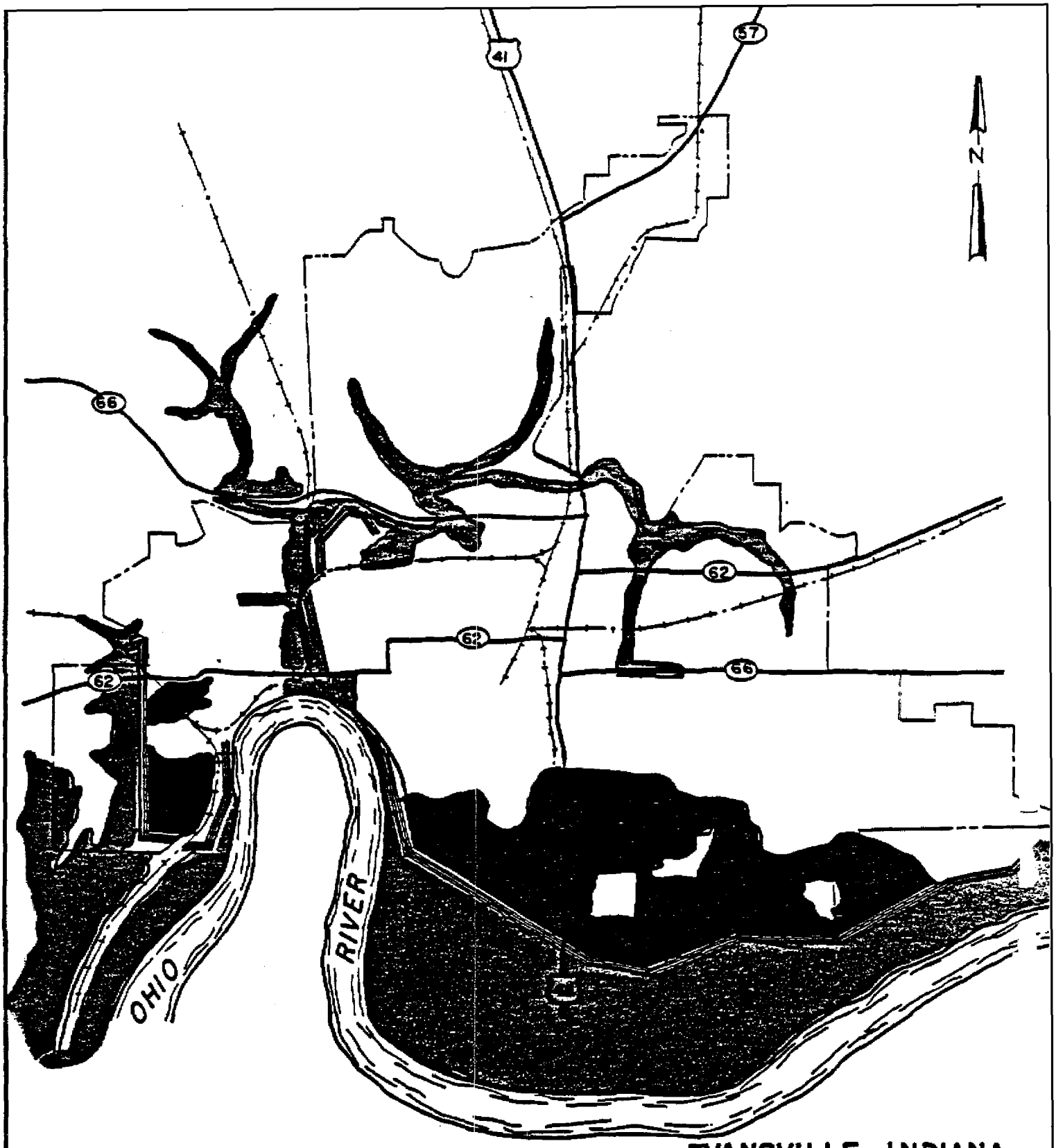
5.8 Residential, Commercial and Industrial Buildings

Section 3.8, Tables 3-6 and 3-7 contains tabulations of damage to these structures for Evansville. This information was used to compute casualties and building availability.

5.9 Casualties, Displaced Persons and Shelter

5.9.1 Deaths, Injuries and Displaced Persons

The deaths and injuries which would occur in Evansville as a consequence of the two postulated earthquakes are summarized in the following table:



LEGEND	
LEVEE	
100 YR. FLOOD PLAIN	
100 YR. FLOOD PLAIN IF LEVEE FAILS	

EVANSVILLE, INDIANA
AREAS SUBJECT TO FLOODING

FIGURE 5-11

Source of Casualties	M= 7.6				M= 8.6			
	Deaths		Injuries		Deaths		Injuries	
	Night	Day	Night	Day	Night	Day	Night	Day
Residential	19	7	75	28	39	15	158	58
Commercial/industrial	7	146	29	585	16	317	63	1,267
Hospitals	1	2	4	8	3	5	12	18
Schools		72		290		155		621
Total casualties	27	227	108	911	58	492	233	1,964
Per 100,000 population*	20	167	79	670	43	362	171	1.445

* Based upon U.S. Bureau of Census Figure

Almost two-thirds of the casualties from a daytime earthquake would occur in commercial, industrial, and office settings. Slightly less than one-third would occur in schools. Relatively few daytime casualties would be experienced in residences and hospitals. Geographically, the highest concentration of daytime casualties would probably occur in the southwestern part of the city in the area bordering the Ohio River loop (census tracts 18, 28, and 29).

Damage to residences, such that they would no longer be habitable, could displace the following numbers of persons:

	Estimated Number of Displaced Persons	
	Ms = 7.6	Ms = 8.6
From single family residences	7,580	29,350
From multi-family structures	3,510	9,500
Total	11,090	38,900
Percentage of population	8%	28%

Up to 24,600 additional persons could be displaced if damaged levees permitted floodwaters to inundate the protected 100 year flood plain in the southern part of the city. Three deaths and three injuries could also occur.

5.9.2 Shelter

The following table shows the number of school structures estimated to be available for use as shelters for both earthquakes.

AVAILABILITY OF SCHOOL STRUCTURES FOR SHELTERS
EVANSVILLE, IN

Total Structures Surveyed	Structures Estimated To Be Available/Percent	
	Ms = 7.6	Ms = 8.6
84	32/38%	12/14%